

The Merits of a Global Equity Asset Class

Risk Management / Asset Allocation
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Objectives

Russell asked the Risk unit to assess the merits of adopting a global equity asset class and address implementation issues.

Recommendations

The Risk unit recommends that:

- 1) CalPERS adopt a global equity asset class;
- 2) We defer to the Equities unit on a preferred global equity benchmark.
 - Leading global equity indices are compared in Appendix A
 - Each index assigns market-cap weights to all countries.

Reasons for global equity asset class

- The same reasons for a policy allocation to international equities also support a global equity benchmark weighted by market caps.
 - Improved diversification
 - Improved opportunity set
- Permits global manager assignments, resulting in:
 - More efficient passive portfolios; and
 - Active portfolios with greater expected outperformance:
 - managers able to take positions on U.S. vs. other countries; and
 - greater returns within sectors because of greater opportunity set.
- Recognizes that prior reasons for home country bias are diminishing
 - Globalization, increasing cross-country trade and capital flows, makes country of domicile or equity exchange less relevant
 - Convergence of accounting and reporting standards
 - Reduced costs of investing internationally
- The opportunity costs of not adopting a global equity asset class are rising with continued globalization, and declining U.S. share of global equity market cap.

Reasons for including emerging market countries at benchmark index market cap weights

- Emerging market (EM) equities have similar risk-adjusted returns
 - Investors are unlikely to systematically undervalue EM equities
 - EM equity valuations were about 50% of the U.S. in 2002, but have since nearly reached parity

- Historical patterns of long-run mean reversion is unfavorable for EM equities
- The Equities unit and its managers (versus the Board) are best suited to make market cap relative EM equity bets.
- Larger than market-cap allocations to emerging market equities does not reduce portfolio volatility.

Reasons for historical home country bias

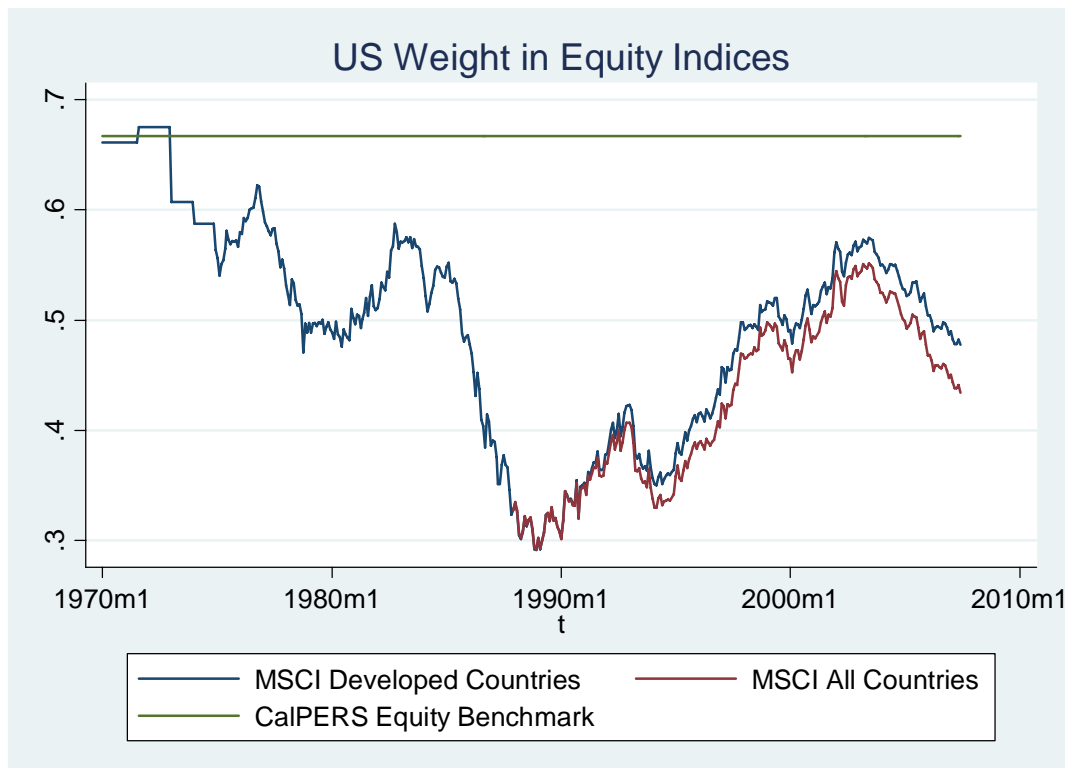
CalPERS has two publicly traded equity asset classes, U.S. and international. The separation has enabled CalPERS to assign a U.S. equity benchmark weight exceeding the U.S. market cap share of a global equity index. This home-country bias can be explained by several reasons:

- CalPERS liabilities are in U.S. dollars to U.S. retirees, so domestic assets better match liabilities.
- A view that U.S. domiciled companies trading on U.S. exchanges are less risky because of more effective regulation, more honest accounting and transparent reporting, and less political risk.
- It costs less to invest in domestic equities because of smaller research, trading, custodial, oversight, and other costs.
- Smaller cap stocks may be more fully represented with separate U.S. vs. international equity asset classes and benchmarks.
- Most investors have a home country bias, so investing similar to others results in less litigation risk.
- The Board prefers to decide on the US-international equity benchmark split, rather than allow it to be determined by relative market caps.

In this paper, we find that these historical reasons for a home country bias are less valid today and are more than offset by the advantages of a global equity asset class benchmarked to a market cap weighted index.

Historical U.S. Equity Allocations

CalPERS Fund benchmark (policy) allocations include 40% U.S. equity and 20% international equity, so U.S. equities represent 2/3 of the policy weighting of publicly traded equities. In comparison, the U.S. share of global equity market cap has ranged from 30% to nearly 70%. The U.S. equity market cap share of all countries including emerging markets has averaged 42.6% since 1988 and ended June 2007 at 43.4%, substantially below the 67% U.S. equity CalPERS policy target.



The U.S. share of global equities will likely decline as the ratio of equity market cap to GDP becomes more similar across countries. The U.S. represents about 43% of the global equity markets but only about 30% of global GDP. A convergence would reduce the U.S. equities share to 30%, while slower U.S. GDP growth would cause the U.S. equities share to decline below 30%.

A declining U.S. equity market cap weight means a rising gap between the U.S. equity market cap weight versus the CalPERS 67% equity allocation to U.S. equities. A larger gap in turn implies a greater bullish (implicitly active) bet on U.S. equities, and greater potential opportunity cost at risk.

REASONS FOR RECOMMENDATION 1. GLOBAL EQUITY ASSET CLASS

A) More Efficient Portfolio

Per CAPM, an efficient portfolio is market-cap weighted, implying that a global equity asset class with benchmark weights has the lowest expected volatility for a given expected return. This conclusion presumes that the equities of any country are neither systematically under or overvalued.

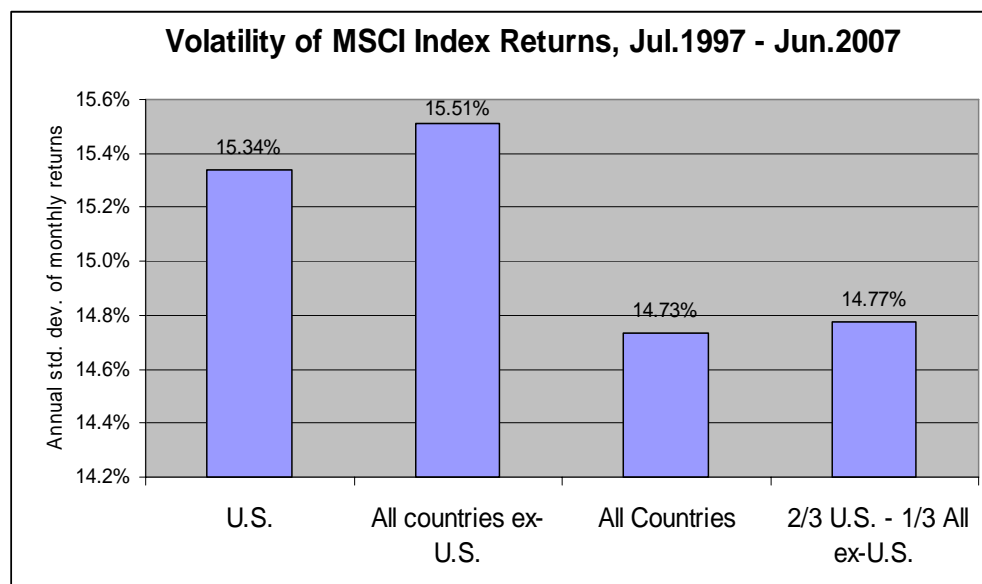
Criticism of the CAPM has been in vogue recently because of findings that not all CAPM assumptions hold and that certain portfolios with non-market cap weights have outperformed market cap weighted portfolios over certain periods. Well even if all CAPM conditions do not all hold or even if we jettison CAPM entirely, a cap-weighted index is still the most diversified index because it replicates the investment opportunity set and thus is the neutral starting point.

To adopt a non-market-cap weighted benchmark implies a view that weaknesses of cap weighting outweigh the diversification advantages. Specifically, a home country bias foregoes the diversification benefits of cap weighting in order to reflect a view that foreign securities are either riskier or have lower expected returns versus domestic securities.

That is, a global cap-weighted benchmark is the most diversified, and reasons are needed to justify an alternative, such as a 2/3 U.S. equity policy weight.

Over the most recent ten years, July 1997 to June 2007, the:

- The inclusion of international equities substantially reduces the volatility of equity returns.
- However a shift from a 2/3 U.S. equity benchmark to a market cap weighted benchmark would not have further materially reduced portfolio volatility, as the risk reduction from the improved diversification was offset by the greater volatility of the international equity returns.



The finding that equity portfolios with 2/3 U.S. weight vs. market cap weights had similar historical volatility does not diminish the greater diversification of a cap-weighted index. During the 1970s, 1980s, and 2000s, the volatility of an equity portfolio would have been minimized with an approximate weight of 50% U.S. equities and 50% international equities, allocations more similar to market cap weighting than the CalPERS policy 2/3 U.S. weight. An overweight to U.S. equities resulted in less volatile returns only during the 1990s (Wilshire, July 2006).

Further, unless the US is singularly insulated from financial storms, an equity portfolio concentrated in a single country is more exposed to potential extreme losses.

B) A Global Equity Asset Class Permits Global Equity Mandates

With separate US equity and international equity asset classes, manager assignments are either domestic or international, because it is difficult to measure or attribute performance of a single global equity mandate across the two asset classes. This back-office difficulty explains the lack of global equity mandates, regardless of their investment merits.

Combining US and international equities into a single global equity asset class eliminates the need to apportion the return of a global equity portfolio across the two asset classes, and thus permits global equity assignments.

Indexed equity portfolios are more efficiently managed with global mandates.

Passive equity assignments generally rely on sampling, holding a subset of benchmark holdings in order to reduce transaction costs while still achieving benchmark-like returns.

Sampling is more efficient when a single portfolio is managed against a single global universe of securities versus managing two portfolios, each against a subset of a global set of securities.

Sampling relies on obtaining representative portfolio exposure across region, sector, and other risk factors. With a global mandate, a passive manager can obtain adequate representation by risk factor with greater flexibility and fewer securities versus separate domestic and international mandates. Consequently, for a global benchmark, any target tracking error can be achieved with smaller transaction costs.

Further, more firms are acquiring foreign companies. With distinct U.S. vs. international equity asset classes, the combining of a U.S. and international company results in benchmark changes and portfolio trading and thus is unnecessarily disruptive and costly to investors. In comparison, a market-cap-weighted global equity benchmark is essentially unaffected by a cross-border merger or acquisition.

Active equity strategies achieve greater outperformance with global mandates. Global mandates are advantaged by the manager's ability to assign benchmark-relative weights to the U.S. versus other countries.

More importantly, a global mandate should also result in greater outperformance within sectors because of the greater number and diversity of companies within sectors. For instance, a manager of a US-only assignment may be bullish on international auto company equities, but not be allowed to buy any. Or the manager may hold U.S. auto stocks primarily for risk-control purposes, at the cost of diminished expected returns.

Certain industries, such as household durables and food products, are dominated by overseas companies, leaving the U.S. equity manager with fewer competitive companies to select from. Conversely US dominance in IT industries may leave slim pickings in large cap tech for international-only mandates. The limited opportunity set of a country or regional assignment limits flexibility, generally resulting in decreased expected returns. Because of globalization, the effect of sector selection on portfolio returns has grown at the expense of country selection (Wilshire, July 2006).

As predicted conceptually, global equity managers have outperformed, at least since 2000.

"Average global equity managers in Mellon Analytic Solutions representative universes have outperformed the combined average U.S. and non-U.S. approach over the past seven years, but the evidence of outperformance is weaker over the longer term." (Frank Russell, June 2007, p.1)

The outperformance of the global assignments has been driven by the advantages of greater opportunity set of securities and by the ability to allocate between U.S. and other equities.

" . . . large bet global equity managers outperformed small-bet global equity managers by 180 basis points from 1990 to 2006. The large bet managers had an information ratio of 0.45, compared to 0.20 for the small-bet managers." (Frank Russell, June 2007, p.3)

With a global equity asset class, CalPERS staff would retain discretion to assign country or regional mandates. For instance, global mandates could be assigned only to managers with perceived competence in global management, while regional or country assignments could continue to be assigned to other managers.

Finally, many managers are experienced with active global equity mandates, so implementation is feasible.

C) Prior Reasons for Separate Domestic versus International Equity Asset Classes are Becoming Less Valid

The additional costs of investing internationally are declining. The incremental costs of investing abroad have declined with advances in information technology. IT advances such as the internet, broadband connections, and teleconferencing have reduced the costs and improved the quality of transmitting information. For example, the cost in 2005 dollars of a 3 minute New-York/London telephone call has declined from \$80 in 1950 to \$0.23 in 2007. The costs of processing information have also declined at an amazing pace. For instance, the cost of performing calculations has declined a billion-fold since WWII (OECD, May 2005, p.3).

IT investment applications such as enhanced financial databases and global electronic trading systems have improved managers' ability to invest globally at low cost.

Accounting and reporting standards are converging. A traditional view, at least until U.S. accounting scandals during 2001-03, has been that U.S. accounting and reporting standards are superior to those in other countries. However, any superiority, if it ever reflected a reality more than a complex, has become less applicable with the evolution toward global accounting standards. [See IASB]

Globalization makes country of domicile or exchange less relevant.

Globalization continues

More companies are evolving into global enterprises by sourcing, producing, and selling across multiple countries. As evidence, the value of imported inputs relative to the value of production has risen from 10% in the 1970s to approximately 30% today, while trading as a percentage of world GDP has risen nearly as much, from 13% in 1970 to 27% in 2004 (OECD, June 2005, p.4).

Capital markets are also becoming more globally integrated. Cross-border capital flows have tripled over the last decade (OECD, June 2005, p.4), so companies are less constrained by local capital markets.

Globalization has been driven by declining trade tariffs,¹ declining costs of global expansion, and continued gains from specialization.

Implications

With advancing globalization, the domicile of a company or the country of its primary equity exchange is becoming less relevant. Classifying the shares of a global company to a single country per the location of its headquarters or per the primary exchange of its equity shares is becoming ever less congruent with the nature of its business activities.

¹ Median tariffs have declined from 29% in 1985 to 13% in 2004 in Non-OECD countries and from 7% to 2% in OECD countries over the same period (OECD, June 2005, p.3).

Diversification versus matching assets and liabilities. The liability argument is that since CalPERS liabilities are to U.S. retirees, assets invested in U.S. securities results in a better match between assets and liabilities.

The response to this argument is three-fold. First, as explained above, many “U.S.” and “foreign” companies are more accurately described as global companies, so for these companies the distinction between U.S. and international is not meaningful.

Second, the argument in support of liability matching, even if true, is outweighed by the diversification benefits of a global mandate. The matching of liabilities is only one criterion guiding CalPERS investment policy. For instance, CalPERS liabilities are bond-like, but not all CalPERS investments are in bonds because of return and diversification reasons. Similarly, CalPERS checks to retirees are in U.S. dollars, but CalPERS assets are not 100% exposed to the U.S. dollar for diversification reasons.

Third, holding only U.S. assets would result in “wrong-way” exposure. CalPERS contributions are paid by California taxpayers, whose ability to pay taxes depends on the growth of the California economy. While there is little empirical relation between equity returns and GDP growth over short periods, an unexpected recession in California and the US would likely result in US equities underperforming international equities, resulting in the need for greater taxes to fund greater contributions, just when recession-strapped Californians would find it most difficult to pay the incremental taxes. In such an adverse scenario, international holdings would reduce the need for incremental tax burdens.

Litigation risk. Litigation risk arises from having an investment policy different from most similarly situated investors and a creative lawyer observing a period when the “maverick” policy underperforms. However U.S. institutional investors have been adopting more balanced equity portfolios (Shoenfeld, 2007, p.30), so the maverick/litigation risk of adopting a global equity asset class should be declining.

Board Preferences. While the Board may prefer to select domestic versus international equity benchmark allocations, this analysis suggests that the opportunity costs of doing so are substantial.

REASONS FOR RECOMMENDATION 2. ASSET CLASS BENCHMARK

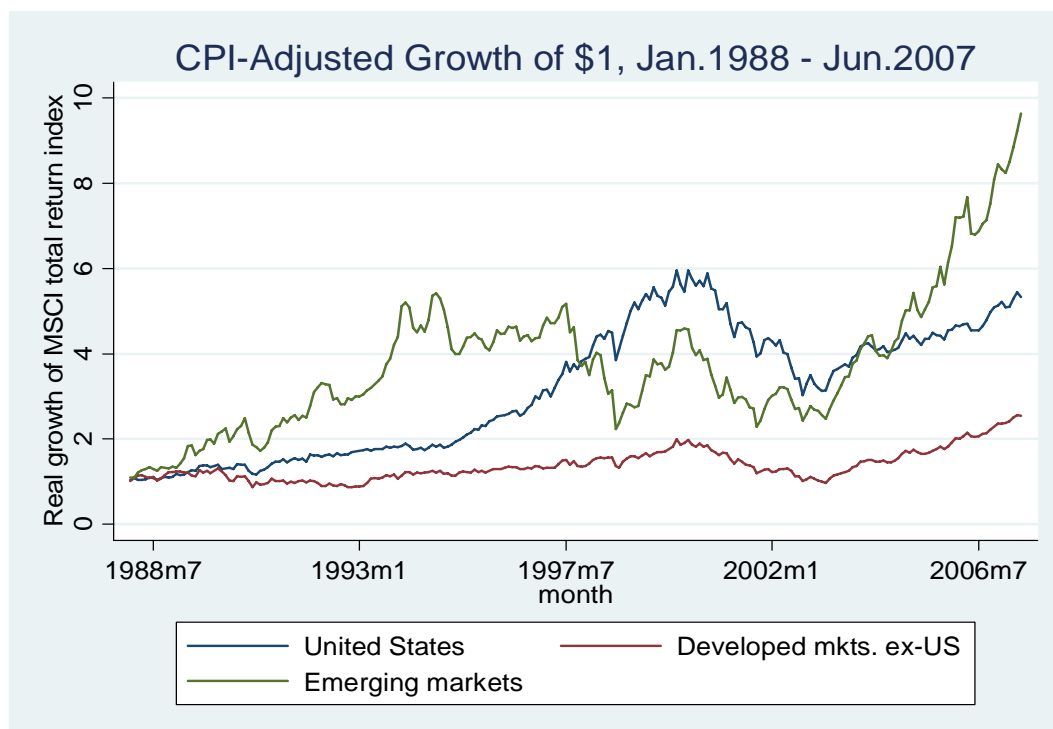
Reasons for not assigning larger than market cap weights to emerging markets

The neutral emerging market equity allocation is its market cap weight. A benchmark overweight (weighting greater than market cap weighting) would presume that emerging markets will either outperform or confer some diversification advantage.

A forecast that emerging market equities will outperform other equities long-term presumes that investors will systematically undervalue emerging market equities.² This is unlikely given investors' relentless pursuit of higher returns and the ample mobility of global capital.

For instance, international equities outperformed in the 1980s while U.S. equities outperformed in the 1990s. Neither case implied that the outperforming region was predestined to continue to outperform, only that investors had misforecast returns by region. Otherwise equity investors would have invested more in Japan in 1980 and more in the U.S. in 1990, in each case pressuring prices up such that subsequent returns were similar across countries.

By analogy, the outperformance of emerging market equities in the 2000s simply means that investors had undervalued and underinvested in emerging markets earlier in this decade, not that emerging markets will continue to outperform.



² For a well-diversified investor such as CalPERS with a small allocation to emerging market equities, there is little meaningful difference between absolute versus risk-adjusted emerging market returns.

Further, from a tactical perspective, emerging market equity valuations were about ½ those of U.S. equities in 2001, but valuations have since converged (Capital Guardian quarterly reports). Thus a primary catalyst for the tremendous outperformance of emerging market equities is no longer present.

Finally, since 1970 the performance difference between U.S. and other developed market equities has exhibited positive momentum over one-month and one-year intervals, but mean reversion over three- and five-year periods. Though the small correlations indicate that momentum and reversion are weak signals, this record suggests that the streak of emerging market outperformance is long in the tooth.

Correlations: U.S. equity relative returns, prior versus future, 1970-2007

| | | Future U.S. relative returns | | | |
|-------------------------------------|---------|------------------------------|--------|--------|--------|
| | | 1 month | 1 year | 3 year | 5 year |
| Past U.S. relative returns | 1 month | -0.06 | 0.11* | 0.04 | -0.03 |
| | 1 year | 0.11* | 0.31* | 0.10* | -0.11* |
| | 3 year | 0.07 | 0.12* | -0.14* | -0.17* |
| | 5 year | -0.01 | -0.06 | -0.14* | -0.11 |

* = correlation is significant at 5%.

U.S. relative return = MSCI U.S. equity return minus MSCI ACWI xUS Equity return.

Board versus Staff/manager decision

Further, the key issue is not whether emerging markets will continue to outperform long-term, the issue is who should make the call. To overweight emerging markets benchmark weights (assign benchmark weights above index market cap weights) is to make an active bet bullish on emerging market equities.

From a Fund governance perspective, the Equities unit and its managers should make the bet on the emerging market portfolio weight relative to the market cap weighted index, rather than have it be set via a non cap weighted benchmark. The Equities unit and their managers are better suited to make this judgment, because they have more knowledge of market conditions, and the flexibility needed to go overweight or underweight emerging market equities in different periods as perceived opportunities evolve. In comparison a benchmark overweight to emerging markets would be difficult to change once in place.

Diversification effects

Regarding diversification, backtests suggest that greater than benchmark allocations to emerging markets would not have resulted in less volatility portfolio returns. The greater volatility of emerging market equities has generally offset any diversification advantages.

Appendix A

Global Equity Indices
 30 March 2007

| | Dow Jones Wilshire | FTSE Global All Cap | MSCI ACWI | Russell Global | S&P/Citigroup BMI |
|----------------------|---|--|--|---|---|
| Countries | 59 | 48 | 48 | 63 | 52 |
| Global Companies | 12,449 (6,500 exUS) | 8,092 | 2,742 | 10,000 (7,000 exUS) | 10,248 |
| U.S. Companies | 5,949 | 2,454 | 621 | 3,000 | 3,322 |
| U.S. weight | | 44.3% | 43.9% | | 43.0% |
| Cap sectors | Large/Mid/Small | | | Large/Small | |
| Target for inclusion | 99% of investable universe; aligns with Dow Jones Wilshire 5000; countries as building blocks | 98% of free float-adjusted market cap of each market | 85% of free float-adjusted market cap of each market | 98% of free float-adjusted market cap of each market; aligns with Russell 3000; stocks as building blocks | All companies with free-float market caps over \$100M and at least \$25M traded over past 12 months |

Source: Steven Shoenfeld, Northern Trust. 16 May 2007